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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,482	10/08/2003	Ebrahim Abedifard	400.242US01	7469
27073	7590	04/15/2005	EXAMINER	
LEFFERT JAY & POLGLAZE, P.A. P.O. BOX 581009 MINNEAPOLIS, MN 55458-1009			HOANG, HUAN	
			ART UNIT	PAPER NUMBER
			2827	

DATE MAILED: 04/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/681,482

Applicant(s)

ABEDIFARD ET AL.

Examiner

Huan Hoang

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-15 and 22-24 is/are allowed.
- 6) ☒ Claim(s) 1, 5, 7-11, 16-18, 20 and 21 is/are rejected.
- 7) ☒ Claim(s) 2-4, 6 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 030504.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5 and 9-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "a first of the erase current" (claim 5, line 2) is confusing since there is only one erase current recited in claim 1.

Claims 5 and 9 recites the limitation "the second reference current level" in line 2 and line 12, respectively. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 5; 7, 9-11, 16 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirano.

Hirano discloses a method of erasing a block of memory in a flash memory device and a flash memory device having all the steps and elements as recited in claims 1, 5, 7, 9-11, 16 and 17 as follows:

generating an erase pulse to the block of memory (column 7, line 17 and column 12, lines 30-33);

performing a current leakage check on each column (column 10, lines 8-13);

if a column is detected having a current leakage, determining an overerased memory cell (column 13, lines 6-9) in the column that has an erase current greater than a first reference current level (column 13, lines 24-27); and

applying a soft program pulse to the overerased memory cell (column 19, lines 1-4 and column 4, lines 29-31) until the erase current is less than the first reference current level.

Regarding claims 5 and 9, the second reference current level is considered to be the reference current (column 3, lines 24-27).

The erase current less than the first reference current level in the step of applying a soft program pulse to the overerased memory cell is inherent.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano in view of Joo.

Hirano discloses all the limitations of claims 8 and 18 except for the flash memory being a NAND-type flash memory. However, Joo discloses the use of a NAND-type flash memory for higher integration (column 1, lines 41-52). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a NAND-type flash memory in order to obtain higher integration.

7. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano in view of Moarotta.

The only difference between claims 20 and 21 and Hirano is that Hirano does not disclose a processor and a state machine in the memory system. However, the processor and the state machine used in a memory system are well-known in the art to provide commands, instruction and control signals for the memory device and this is shown by Marotta (Fig. 1). It would have been obvious to one having ordinary skill in the art to use a processor and a state machine in a memory system in order to provide provide commands, instruction and control signals for a memory device.

***Allowable Subject Matter***

8. Claims 12-15 and 22-24 are allowed.

9. Claims 2-4, 6 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to disclose the following limitations:

prior to performing the current leakage check, applying additional erase pulses to memory cells that have an erase current less than a second reference current until the erase current is at least equivalent to the second reference current level.

wherein the block of memory further includes a plurality of wordlines coupling rows of memory cells and the method further including applying a positive voltage to a selected wordline of the plurality of wordlines and a negative voltage to unselected wordlines.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huan Hoang whose telephone number is (571) 272-1779. The examiner can normally be reached on Mon-Fri 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoai Ho can be reached on (571) 272-1777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Huan Hoang  
Primary Examiner  
Art Unit 2827

HH  
4/13/05.